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10/585,044	06/29/2006	Markus Kress	BE - 184PCT	2580

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EXAMINER	
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ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,044	KRESS, MARKUS	
	Examiner	Art Unit	
	MICHAEL C. COLUCCI	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

NOTE: Examiner acknowledges the cancellation of claim 11.

Drawings

1. The drawings were received on 09/29/2008. These drawings are acceptable.

Response to Arguments

2. Applicant's arguments filed 09/29/2008 have been fully considered but they are not persuasive.

Argument 1 (page paragraph 2):

- "The reference to Lapere definitely does not disclose the derivation of comparative signals exclusively from a subphonemic range of the sound utterance"

Response to argument 1:

Examiner takes the position that Lapere alone in fact appears to clearly teach the limitations of claim 1, particularly the identification of a user through the recognition of sub-phonemic means. Though Lapere teaches resolution, the resolution is used as a means to further clarify and identify the user, wherein noise is better distinguished from sound in addition to subphonemic analysis. Lapere teaches a method of a speaker verification system for generating multi-resolution models. The method includes providing a plurality of occurrences of an utterance, and coding each occurrence; scoring each coding against each

occurrence and selecting the coding with the best score that best represents each occurrence; segmenting each occurrence according to the selected coding; creating a first resolution model from the selected coding by identifying, for each segment of the selected coding, the best coding of corresponding segments of all occurrences that best represents each segment, and replacing the corresponding segment in the selected coding, if different; creating a lower resolution model from the first resolution model for discriminating speech-only content of the utterance from non-speech sounds and noise present in the utterance; scoring each occurrence against the lower resolution model for an estimate of speech-only content of the occurrence, and storing the resulting time-normalized occurrence scores; resegmenting the speech-only content of each occurrence against the first resolution model, and storing the resulting time-normalized scores; creating a high resolution model from the first resolution model, the high resolution model being speaker specific; and rescoring the speech-only content each occurrence against the high resolution model, and storing the resulting time-normalized scores (Col. 3 lines 14-65).

However, Peckham has been incorporated to further strengthen the teachings of Lapere, wherein Peckham teaches the use of quasi-periodic as well as subphonemic instances when analyzing input speech. Further, Peckham teaches in parallel a *quasi-periodic range* and *subphonemic subranges* such as that recited in the present invention (specification of present invention "*A quasi-*

periodic range is present whenever the utterance contains a vowel or semivowel" page 2 line 31 – page 3 line 10). Therefore, Lapere in view of Peckham clearly demonstrates a speak identification/verification system that utilizes a quasiperiodic and subphonemic analysis wherein analyzing a speech signal, where Peckham teaches that during the verification process, each speaker is asked to make three separate test utterances, typically of three different words. These words will be selected from a group of, e.g. ten words for which data concerning the speaker whose identity is claimed will have been stored during an enrolment session. The effectiveness of the speaker verification system is influenced to some extent by the choice of words used for the test utterances. The process of selecting suitable words will inevitably involve a degree of trial and error. However, certain rules can be followed to identify words which are more likely to be suitable. First, each word preferably contains at least two syllables. The words should be chosen so that each set of three to be used in a verification procedure provides a wide range of consonants, vowels and pronunciation timing. Finally , it is important to find words which are pronounced in a consistent manner (Peckham page 5 lines 1-15).

Further, Peckham teaches the ability to analyze various inconsistencies in speech such as a silence period, syllabic segments, or word portions, wherein Peckham teaches the identification of vowels, wherein Peckham teaches that there are brief gaps of very low energy between the syllables in the spoken word.

As shown in Figure 6, the maximum energy peak is during the syllable "Man". The low level to which the energy falls between the syllables "ches" and "ter" may be so low as to be less than 10 per cent of the maximum energy value. Therefore, if the system for identifying the start and end points of the spoken word takes the maximum energy peak in the syllable "Man", and moves forwards and backwards in time until the energy falls to 10 per cent of the peak value, the system will identify only the syllables "Man" and "ches" as being part of the spoken word, and the syllable "ter" will be ignored and not used in the analysis of the spoken word (Peckham page 7 lines 51-57).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lapere (US Patent 6,272,463) as applied to claim 1 above, and further in view of Peckham et al. (EP 0424071 A2).

As per claim 1, Lapere teaches a method for identifying people, in which a person is identified by comparing an electrical signal derived from a particular utterance by the person with a stored signal of this kind, wherein the signals to be compared are

derived from a subphonemic range of the utterance (Fig. 3, more specifically steps 305, 307, 309, and 321. Also, Col. 7, lines 1-5).

and selecting the range from a quasi-periodic range of an electric output siqnal of an electro-acoustic transducer corresponding to the total utterance (Col. 3 lines 14-65).

However, Lapere fails to teach a quasi-periodic range

Peckham teaches a speak identification/verification system that utilizes a quasiperiodic and subphonemic analysis wherein analyzing a speech signal, where Peckham teaches that during the verification process, each speaker is asked to make three separate test utterances, typically of three different words. These words will be selected from a group of, e.g. ten words for which data concerning the speaker whose identity is claimed will have been stored during an enrolment session. The effectiveness of the speaker verification system is influenced to some extent by the choice of words used for the test utterances. The process of selecting suitable words will inevitably involve a degree of trial and error. However, certain rules can be followed to identify words which are more likely to be suitable. First, each word preferably contains at least two syllables. The words should be chosen so that each set of three to be used in a verification procedure provides a wide range of consonants, vowels and pronunciation timing. Finally , it is important to find words which are pronounced in a consistent manner (Peckham page 5 lines 1-15).

Further, Peckham teaches the ability to analyze various inconsistencies in speech such as a silence period, syllabic segments, or word portions, wherein Peckham teaches the identification of vowels, wherein Peckham teaches that there are brief gaps

of very low energy between the syllables in the spoken word. As shown in Figure 6, the maximum energy peak is during the syllable "Man". The low level to which the energy falls between the syllables "ches" and "ter" may be so low as to be less than 10 per cent of the maximum energy value. Therefore, if the system for identifying the start and end points of the spoken word takes the maximum energy peak in the syllable "Man", and moves forwards and backwards in time until the energy falls to 10 per cent of the peak value, the system will identify only the syllables "Man" and "ches" as being part of the spoken word, and the syllable "ter" will be ignored and not used in the analysis of the spoken word (Peckham page 7 lines 51-57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Lapere to incorporate a quasi-periodic range as taught by Peckham to allow for the ability to analyze various inconsistencies in speech, wherein the start and end points of a word can be analyzed on a syllable basis having vowels, consonants, and pronunciation pertinent in the identification of a speaker/person (Peckham page 7 lines 51-57).

As per claim 2, Lapere teaches the method as claimed in claim 1, but does not specifically mention wherein in a first step for deriving the signals an electrical output signal from an electro-acoustic transducer (1), which output signal corresponds to the entire utterance, is subjected to volume normalization.

However, Peckham et al. teach

wherein in a first step for deriving the signals an electrical output signal from an electro-acoustic transducer (1), which output signal corresponds to the entire utterance, is subjected to volume normalization (Page 5, lines 35-36, where the volume normalization is represented as the normalized energy for the analyzed utterance).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein in a first step for deriving the signals an electrical output signal from an electro-acoustic transducer (1), which output signal corresponds to the entire utterance, is subjected to volume normalization as taught by Peckham et al. for Lapere's method because Peckham et al. provides pitch analysis to permit pitch synchronous analysis (Page 5, lines 38-40).

As per claim 3, Lapere teaches the method as claimed in claim 1, but does not specifically mention wherein a Fourier series approximating an output signal corresponding to the entire utterance is formed.

However, Peckham et al. teach

wherein a Fourier series approximating an output signal corresponding to the entire utterance is formed (Page 5, lines 32-35 and Page 9, lines 10-11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein a Fourier series approximating an output signal corresponding to the entire utterance is formed as taught by Peckham et al. for Lapere's method because Peckham et al. uses cepstral coefficients in order to create a highly effective speaker verification system (Page 5, lines 38-39).

As per claim 4, Lapere, as modified by Peckham et al., teach the method as claimed in claim 2. Lapere does not, but Peckham et al. does teach wherein to derive the signals which are to be compared at least one quasi-periodic range of the output signal is ascertained (Page 3, lines 27-31. The quasi-periodic range here is referred to as the analyzed pitch periods.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein to derive the signals which are to be compared at least one quasi-periodic range of the output signal is ascertained as taught by Peckham et al. for Lapere's method because by controlling the timing of the analysis frame periods, it is possible to reduce inconsistencies of analysis which might otherwise arise due to the difference between the length of the analysis period and the length of the pitch period (Page 3, lines 31-33).

As per claim 5, Lapere, as modified by Peckham et al., teach the method as claimed in claim 4. Lapere does not, but Peckham et al. does teach wherein to derive the signals which are to be compared a single quasi-period or a plurality of quasi-periods is/are selected from the ascertained quasi-periodic range (Page 3, lines 27-31. The quasi-periodic range here is referred to as the analyzed pitch periods, and the quasi-period selected is the "timing of the frame periods" which is determined according to the analyzed pitch periods.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein to derive the signals which are to be compared a single quasi-period or a plurality of quasi-periods is/are selected from the ascertained quasi-periodic range as taught by Peckham et al. for Lapere's method because by controlling the timing of the analysis frame periods, it is possible to reduce inconsistencies of analysis which might otherwise arise due to the difference between the length of the analysis period and the length of the pitch period (Page 3, lines 31-33).

As per claim 6, Lapere, as modified by Peckham et al., teach the method as claimed in claim 5. Lapere does not, but Peckham et al. does teach wherein a quasi-period (n) determined in relation to its position in the quasi-periodic range (1 to m) is selected (Page 3, lines 27-31. The quasi-periodic range here is referred to as the analyzed pitch periods, and the quasi-period selected is the "timing of the frame periods" which is determined according to the analyzed pitch periods).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein a quasi-period (n) determined in relation to its position in the quasi-periodic range (1 to m) is selected as taught by Peckham et al. for Lapere's method because by controlling the timing of the analysis frame periods, it is possible to reduce inconsistencies of analysis which might otherwise arise due to the difference between the length of the analysis period and the length of the pitch period (Page 3, lines 31-33).

As per claim 7, Lapere, as modified by Peckham et al., teach the method as claimed in claim 5. Lapere does not, but Peckham et al. does teach wherein the selected quasi-period is subjected to length normalization (Page 3, lines 29-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein the selected quasi-period is subjected to length normalization as taught by Peckham et al. for Lapere's method because by controlling the timing of the analysis frame periods, it is possible to reduce inconsistencies of analysis which might otherwise arise due to the difference between the length of the analysis period and the length of the pitch period (Page 3, lines 31-33).

As per claim 8, Lapere, as modified by Peckham et al., teach the method as claimed in claim 5. Lapere does not, but Peckham et al. does teach wherein a quotient signal is formed from the selected quasi-period and from a quasi-period which is influential an an average voice (Page 3, lines 29-36, and Page 14, lines 7-8).

It is noted that Peckham et al. does not specifically mention forming a quotient signal from the selected quasi-period and from a quasi-period which is influential as an average voice, however, it is well known in the art the use of similarity (or distance) measurements to determine how close two signals are from each other for classification, speech recognition, speaker identification, speaker verification, etc. Methods for similarity measurements such as root mean square distance, correlation functions, dynamic programming, and quotient determination, are well known in the art, which compare the result to a threshold or a predetermined number in order to make a

determination. Peckham et al. uses dynamic programming for making this determination, however, it would have been obvious to a person having ordinary skill in the art at the time of the invention, to try any one of the known methods that yield predictable results with a reasonable expectation of success.

As per claim 9, Lapere teaches the method as claimed in claim 1, however Lapere does not specifically mention wherein to form comparison signals which are to be stored the utterance is recorded a plurality of times at different pitches and, during identification, is interpolated between plurality of comparison signals, or interpolation is used to form a family of curves for comparison signals.

However, Peckham et al. teach

wherein to form comparison signals which are to be stored the utterance is recorded a plurality of times at different pitches and, during identification, is interpolated between plurality of comparison signals, or interpolation is used to form a family of curves for comparison signals (Page 3, lines 34-36, Fig. 8, Page 9, lines 45-54 and Page 13, lines 21-24. Also Fig. 12 and Page 14, lines 3-8 and 19-21.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of wherein to form comparison signals which are to be stored the utterance is recorded a plurality of times at different pitches and, during identification, is interpolated between plurality of comparison signals, or interpolation is used to form a family of curves for comparison signals as taught by Peckham et al. for Lapere's method because by providing an utterance a plurality of

times a refined model may be obtained which reduces or eliminates the effect of uncharacteristic utterances, and tends to improve the quality of the final reference template obtained by the speaker verification system (Page 10, lines 42-44) and therefore enhancing the accuracy of the comparison operations.

As per claim 10, Lapere teaches the method as claimed in claim 1, wherein the method is integrated into a voice recognition program (Fig. 3 and Col. 7, lines 1-2).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-

270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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